# Global Command and Control System - Maritime (GCCS- M)

# System Administrator's Manual (SAM) for COAMPS-OS® Version 1.0.0.0

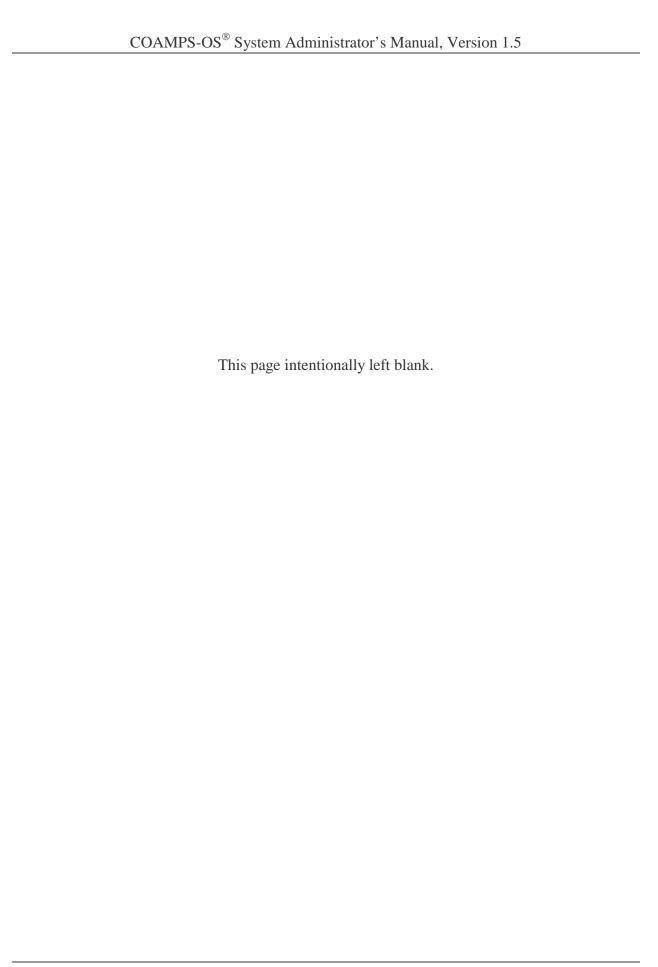
**Document Version 1.5** 

**April 15, 2002** 

Prepared for: Space and Naval Warfare Systems Command (SPAWAR)

Prepared by:
Ms. Sarah Bargsten
Computer Sciences Corporation (CSC)
Monterey, CA

Mr. Daniel Geiszler Science Applications International Corporation (SAIC) Monterey, CA



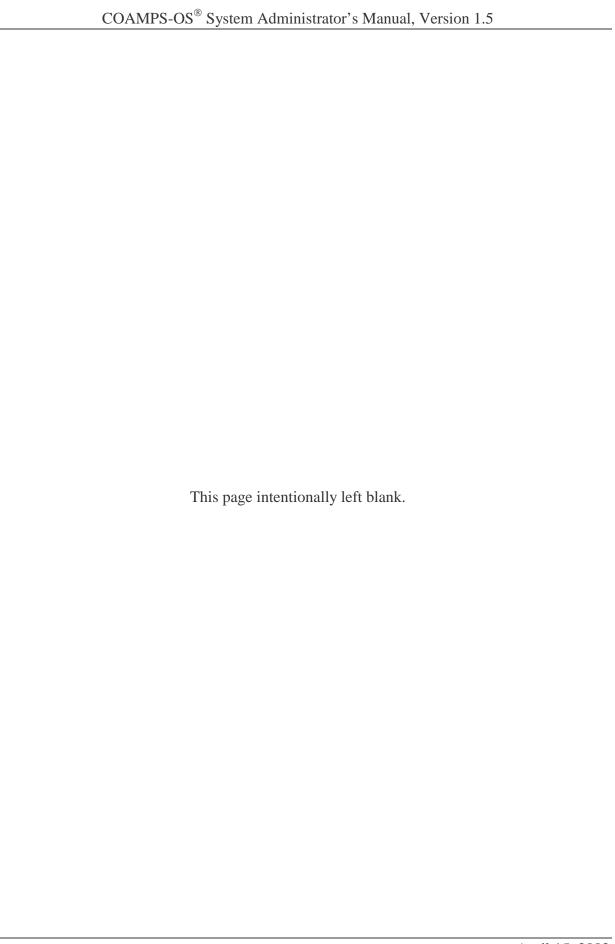
# **Table of Contents**

1	Scope	1
1.1	Identification	1
1.2	System Overview	1
2	References	2
2.1	Acknowledgements	2
2.2	COAMPS-OS® Documents	2
2.3	Other References	2
3	Operating Guidelines Error! Bookm	nark not defined.
4	Installation Overview	4
5	System Administration Utilities	5
6	COAMPS-OS® System Passwords and Privileges	6
6.1	Passwords	6
6.2	Privileges	6
7	Operation/Maintenance Procedures	7
7.1	System Administration Tasks	7
	7.1.1 Routine Tasks Regarding System Status	7
	7.1.2 Backup Procedures	9
	7.1.2.1 COAMPS-OS® Backup Strategy10	
7.2	COAMPS-OS® Biweekly System Administration Tasks	11
	7.2.1 Check COAMPS-OS® project disk usage (2 weeks)	11
	7.2.2 Check COAMPS-OS® Log Directories and Files	11
	7.2.3 Graphical Products	12
8	The COAMPS-OS® Remote Monitor (RM)	14
8.1	Grids from TEDS Status Page	17
8.2	Observations from TEDS Status Page	19
8.3	Available NOGAPS Status Page	21

8.4	For	ecast Status Page	23
	8.4.1	Summary File	26
	8.4.2	Time Step Plot	28
	8.4.3	Score Files	30
	8.4.4	Forecast Score Report	31
8.5	No	wcast Status Page	32
8.6	Pro	duct Status Page	34
	8.6.1	Project Product Logs	35
8.7	Ma	chine Status Page	39
8.8	Sta	tistics Status Page	41
8.9	CO	AMPS-OS® Remote Monitor Configuration Page	43
0	CI		4.5
		ging System Identity	
9.1		w IP address	
9.2		w hostname/domain name	
9.3	Nev	w IdentityError! Bookmark n	ot defined.
	Install	ing and Configuring the COAMPS-OS® Webserverache Webserver	46
<b>10</b> 10.1	Install	ing and Configuring the COAMPS-OS® Webserver	<b>46</b>
<b>10</b> 10.1	<b>Install</b> Apa	ing and Configuring the COAMPS-OS® Webserver	<b>46</b> 46
<b>10</b> 10.1	Install Apa	ing and Configuring the COAMPS-OS® Webserverache Webserver	464646
<b>10</b> 10.1	Apa 10.1.1 10.1.2 10.1.3	ing and Configuring the COAMPS-OS® Webserver	46 46 46 46
<b>10</b> 10.1	Apa 10.1.1 10.1.2 10.1.3	ing and Configuring the COAMPS-OS® Webserver	46 46 46 46
10 10.1	Apa 10.1.1 10.1.2 10.1.3 Error	ing and Configuring the COAMPS-OS® Webserver	46464647
10 10.1	Apa 10.1.1 10.1.2 10.1.3 Error	ing and Configuring the COAMPS-OS® Webserver  ache Webserver  Apache Software Installation  Apache Aliases  Apache Password Protection  Recovery Guidelines	4646464750
10 10.1 11 12 12.1	Apa 10.1.1 10.1.2 10.1.3 Error	ing and Configuring the COAMPS-OS® Webserver  ache Webserver  Apache Software Installation  Apache Aliases  Apache Password Protection  Recovery Guidelines  assary of Acronyms	4646464750
10 10.1 11 12 12.1 App	Install Apa 10.1.1 10.1.2 10.1.3 Error Notes Glo	ing and Configuring the COAMPS-OS® Webserver  ache Webserver  Apache Software Installation  Apache Aliases  Apache Password Protection  Recovery Guidelines  assary of Acronyms	4646464750
10.1 10.1 11 12.1 App App	Install Apa 10.1.1 10.1.2 10.1.3 Error Notes Globendice endix	ing and Configuring the COAMPS-OS® Webserver  ache Webserver  Apache Software Installation  Apache Aliases  Apache Password Protection  Recovery Guidelines  essary of Acronyms	4646464750

# **Table of Figures**

Figure 1. Main Remote Monitor page	15
Figure 2. Example of RM page with grids retrieval status.	17
Figure 3. Example of RM page with observations retrieval status	19
Figure 4. Example of RM page with NOGAPS status	21
Figure 5. Example of RM page with forecast status.	23
Figure 6. Forecast status for each project by user "coamps"	24
Figure 7. Example of RM page with project summary information	26
Figure 8. Example of a time step plot.	28
Figure 9. Example of score page, with links to <i>Nowcast</i> and forecast score reports	30
Figure 10. Example of score page, showing status for all project datetime groups	31
Figure 11. Example of <i>Nowcast</i> page	32
Figure 12. Example of a <i>Nowcast</i> summary page	33
Figure 13. Example of selecting the RM products status according to user	34
Figure 14. Example of RM product status page for COAMPS® IPVS_Charts	35
Figure 15. IPVS_CHARTS product status page	36
Figure 16. Example of the machine status page.	39
Figure 17. Example of COAMPS-OS® webserver statistics page	41
Figure 18. Example of RM configuration page.	43
List of Tables	
Table 6-1. Tape Allocation for COAMPS-OS® Backup Strategy	10
Table 6-2. Contents of the Log Directory	12
Table 6-3 Default graphical products of COAMPS-OS® for all grids	13
Table 8-1. Default Threshold Values for Machine Status Reports	40



# 1 Scope

#### 1.1 Identification

This System Administrator's Manual describes the procedures to install, configure and maintain the Coupled Ocean/Atmosphere Mesoscale Prediction System On-Scene (COAMPS-OS®), developed by the Naval Research Laboratory (NRL) in Monterey, CA.

## 1.2 System Overview

COAMPS-OS® is an on-scene weather prediction system that incorporates database and visualization components to support the Navy's Coupled Ocean/Atmosphere Mesoscale Prediction System (COAMPS®). COAMPS® is a globally relocatable, non-hydrostatic numerical weather prediction (NWP) model capable of weather prediction at spatial and temporal scales of 1-100 km and 0-72 hours, respectively. COAMPS-OS® is comprised of two Common Operating Environment (COE) segments, COAMPS® and COWEB. The COAMPS® segment must be installed prior to the installation of the COWEB segment. Documentation describing the COAMPS® and COWEB segments can be found in Section 2.

The Marine Meteorology Division of the Naval Research Laboratory (NRL) in Monterey, CA is the primary point of contact for the COAMPS-OS® system.

#### 2 References

## 2.1 Acknowledgements

The System Administrator's Manual represents a collaborative effort between the Marine Meteorology Division of the Naval Research Laboratory (NRL) in Monterey, California, and the contracting organizations of Computer Science Corporation (CSC), Neptune Sciences Inc., and Science Applications International Corporation (SAIC).

CSC	NRL	Neptune Science	SAIC
Bargsten, Sarah	Cook, John	McDermid, Lari Nell	Geiszler, Daniel
Grant, Daren	Lande, Rosemary		Kent, John
Franco, Francisco	Phegley, Larry		Strahl, Jennifer
Frost, Linda			
Frost, Michael			
Martinez, Daniel			

# 2.2 COAMPS-OS® Documents

January 2002	COAMPS-OS® Installation Procedures	
January 2002	Software Test Description for COAMPS-OS® COAMPS® and COWEB Segments	
January 2002	COAMPS-OS® GUI User's Manual	

#### 2.3 Other References

#### **Essential System Administration**

Éleen Frisch, O'Reilly & Associates, Inc., December 1995

Fleet Numerical Meteorology and Oceanography Center, Monterey, CA

Installation Manual for the Regional Center System, Revision D, May 1999

SPAWAR/ METOC Installation Procedures for the MDGRID Segment of the TESS(NC) METOC Database, Version 4.1, January 1999

SPAWAR/ METOC Installation Procedures for the MDIMG Segment of the TESS(NC) METOC Database, Version 4.1, January 1999

SPAWAR/ METOC Installation Procedures for the MDLLT Segment of the TESS(NC) METOC Database, Version 4.1, January 1999

SPAWAR/ METOC Installation Procedures for the MDTXT Segment of the TESS(NC) METOC Database, Version 4.1, January 1999

# 3 Installation Overview

The COAMPS-OS® system is installed from a CD-ROM. Instructions for installing and configuring COAMPS-OS® are outlined in the COAMPS-OS® Installation Procedures document referenced in Section 2.

# 4 System Administration Utilities

The COAMPS-OS<sup>®</sup> Remote Monitor is accessible from the COAMPS-OS<sup>®</sup> Homepage and serves as a comprehensive system administration utility for COAMPS-OS<sup>®</sup>. If installed and configured properly, the Remote Monitor will send email notifications regarding COAMPS-OS<sup>®</sup> data receipt, data dissemination, visualization products, COAMPS-OS<sup>®</sup> machine status, and the status of other COAMPS-OS<sup>®</sup> processes. The COAMPS-OS<sup>®</sup> system administrator can respond to any issue that may arise.

A thorough understanding of each facet of the COAMPS-OS® system and related data flow is necessary to maintain a robust, effective product generator for operational users.

# 5 COAMPS-OS® System Passwords and Privileges

#### 5.1 Passwords

Because several applications may be started from the **COAMPS-OS**<sup>®</sup> **Homepage**, it is important to uphold high security standards in managing the COAMPS-OS<sup>®</sup> system passwords. The applications require higher security because they may alter processes and disk usage. Therefore, care must be taken when assigning, distributing, and changing passwords.

The COAMPS-OS® GUI, Meteogram GUI, IPVS\_CHARTS, and Vis5D applications are accessible from the COAMPS-OS® Homepage. The applications share a single username and password. The HPAC and VLSTRACK applications should share a separate username and password from the other applications. A third username and password should be assigned to access the World Meteorological Organization (WMO) ingest application. COAMPS-OS® projects with "\_pw" extensions in the project name are password protected using a fourth username and password.

## 5.2 Privileges

Before the COAMPS-OS® system becomes fully operational at the site, assign **RESOURCE** privileges to MDGRID database to create tables/indices. The steps to assign **RESOURCE** privileges are listed below.

- 1. On the TEDS database server, login as user "informix".
- 2. Enter the command:

```
echo "grant resource to coamps | dbaccess mdgrid_db_ _"
```

- 3. Enter the command:
  - echo "grant resource to coamps | dbaccess mdrem db "
- 4. Enter the command:
  - echo "grant resource to coamps | dbaccess mdllt\_db\_ \_"

# **6** Operation/Maintenance Procedures

The following sections provide detailed steps for maintaining the  $COAMPS-OS^{\otimes}$  system. Refer to Appendices A and B for printable worksheets to itemize system maintenance tasks.

## **6.1** General System Administration Tasks

#### **6.1.1** Routine Tasks Regarding System Status

The following list of tasks is provided to help guide the UNIX system administrator in developing a schedule for maintaining the COAMPS-OS® system. Each procedure may be implemented as frequently as the system administrator deems appropriate. However, the tasks should be performed regularly.

- 1. Check the network connections to verify connectivity:
  - ping system from other systems.
  - ping other systems.

The ping command sends packets of formatted data to a remote system and requests a response from the remote server. If the data packets successfully reach the remote system, and the remote system responds, the output of the ping command may resemble:

A simpler response also indicating that data was received from the remote server is:

If the ping command does not return a response, the remote system may be unavailable, or the network between the local system and remote system may be down.

- 2. Check for network errors in the following areas:
  - netstat -i (interface)
  - netstat -r (routing)
  - nfsstat (NFS)
  - nslookup <system in local domain > (DNS)
  - nslookup <system outside domain> (DNS)

The netstat –i command displays a table of all available networking interfaces.

The netstat –r displays the kernel routing tables.

The nslookup command may be used to map a hostname to an ip address, or map an ip address to a hostname. An example of the nslookup command and output are shown below:

/usr/sbin/nslookup cavu

Server: biolante.nmm.nrlmry.navy.mil

Address: 199.9.0.113

Non-authoritative answer:
Name: cavu.nrlmry.navy.mil

Address: 199.9.2.76

3. Check print queues: lpstat -t

The lpstat command prints information describing the status of the local print service. The -t option prints all status information. Execution of lpstat -t may yield the following output:

scheduler is running no system default destination

COAMPS-OS® software does not depend on the lpd (print daemon); however, the lpd permits users to print contents from a web-browser or IPVS\_CHARTS.

4. Check mail queues: sendmail -bp

The COAMPS-OS® Remote Monitor requires sendmail for emailing status reports to the COAMPS-OS® system administrator. If sendmail is not running or is not properly configured, the Remote Monitor will be unable to email system status information to users. The sendmail – bp command prints a summary of the mail queue. The command should produce the following output:

#### Mail queue is empty

- 5. Check for bounced mail errors, cron errors, and other system problems.
- 6. Check for mail backups in the mail queue.
- 7. Confirm the following daemons are running:
  - sendmail (required for COAMPS-OS® email notification)
  - in.named
  - cron (required for COAMPS-OS® batch job execution)
  - lpd (required for COAMPS-OS® printing)
  - inetd
- 8. Ensure the file systems are operating below 90% capacity.
- 9. Check the file space (MB) allocated to a single directory.

The du command may be used to determine the space occupied by files within a directory:

8



#### du -sk <directory\_name>

Pay close attention to the following directories:

- /h/data/global/COAMPS/\*
- /h/data/global/COWEB/\*
- 10. Check for recent system logins using the **last** command.
  - Note users' login addresses.
  - Note last system boot.
- 11. Examine the system logs for unusual events, warnings, or errors.
- 12. Check uptime and load using the **uptime** command.
- 13. Check the process table using the **ps** -ef command.
  - Note that the number of jobs is within reason considering the system resources.
  - Note the time on each job is appropriate.
- 14. Check the active processes using the **top** command.
- 15. Check for users currently logged into the system using the **w** command.

Examine the output of the w command for the following information:

- How long each user has been logged in.
- How many users are logged in.
- Idle time associated with each user. Large values for the idle time may indicate a stale connection or a user who has not logged out.
- 16. Reboot the system periodically.

A system should be rebooted for the following reasons:

- Clear process tables,
- Remove temporary files.
- Rotate the logs (Sun).
- Check hardware integrity.
- Check output of bootup for system errors.
- 17. Backup system on a consistent basis. (Instructions are detailed in Section 6.1.2.)

#### **6.1.2** Backup Procedures

A system administrator may incorporate a wide variety of mechanisms to periodically backup a system. The instructions included in section 6.1.2.1 are included to provide a system administrator with one potential strategy for backing up a system with COAMPS-OS® software.

# 6.1.2.1 COAMPS-OS® Backup Strategy

In order to implement the backup strategy provided, obtain a script for the level 5 (differential) and level 0 (complete) backups. Tapes should be allocated for the COAMPS-OS® system as specified in Table 6-1. The following directories are associated with COAMPS-OS® and should be included with any backup of a system:

- /h/COAMPS (COAMPS Server)
- /h/COWEB (Webserver)
- /h/data/global/COAMPS (COAMPS Server)
- /h/data/global/COWEB (Webserver)

**Daily** backups should be performed at the end of each day.

- Perform level 9 incremental backups.
- Label 4 tapes for the COAMPS-OS® webserver and 8 (2 per day) for the COAMPS-OS® computational server for the days of the week Monday through Thursday.
- Recycle the 4 tapes for the COAMPS-OS® webserver and 8 for the COAMPS-OS® computational server each week, using the command: tar cv /tmp.

Weekly backups should be performed at the end of each week, on Friday.

- Perform level 5 differential backups.
- Label 24 tapes for the COAMPS-OS<sup>®</sup> webserver and 48 for the COAMPS-OS<sup>®</sup> computational server according to the calendar date of the backup.
- Recycle the 24 tapes for the COAMPS-OS® webserver and 48 for the COAMPS-OS® computational server tapes every six months (24 weeks).

**Monthly** backups should be performed on the last day of each month.

- Perform level 0 complete backups.
- Label 3 tapes for the COAMPS-OS<sup>®</sup> webserver and 6 for the COAMPS-OS<sup>®</sup> computational server according to the calendar date of the backup.
- Recycle the 3 tapes for the COAMPS-OS® webserver and 6 for the COAMPS-OS® computational server every three months (12 weeks).

Table 6-1. Tape Allocation for COAMPS-OS® Backup Strategy

Timeframe	Number of Tapes	Recycle Tape
Daily	12	every week
Weekly	72	every 24 weeks
Monthly	9	every 12 weeks

# **6.2** COAMPS-OS® Biweekly System Administration Tasks

COAMPS-OS<sup>®</sup> includes software applications dedicated to running COAMPS<sup>®</sup>, producing graphical products, maintaining an observational and NOGAPS database, and distributing COAMPS<sup>®</sup> output fields to TEDS. The following tasks should be performed every two weeks to ensure that COAMPS-OS applications are running properly.

# 6.2.1 Check COAMPS-OS® project disk usage

Each COAMPS® forecast produces a large number output files. The output files may occupy a significant amount of disk space. To examine the amount of disk space used by individual projects, change directories to /h/data/local/COAMPS/nodes/coamps/COAMPS. Type the following command:

The **du** -sk command lists the approximate number of kilobytes of disk space contained within each of the subdirectories located in /h/data/local/COAMPS/nodes/coamps/COAMPS/. If a project is occupying too much disk space and the output files are no longer needed, the user may remove the project by typing:

The output files from a project may also be removed using the COAMPS-OS® GUI. Refer to the COAMPS-OS® User's Manual, referenced in Section 2, for more details describing the procedures to remove project data files using the COAMPS-OS® GUI.

# 6.2.2 Check COAMPS-OS® Log Directories and Files

Each COAMPS<sup>®</sup> analysis and forecast produces log files containing information describing the state of the analysis/forecast. If COAMPS<sup>®</sup> is executing properly, log files should be produced with each executed COAMPS<sup>®</sup> analysis and COAMPS<sup>®</sup> forecast. The log files are located in:

## /h/data/global/COAMPS/nodes/coamps/COAMPS/<project name>/log/

Table 6-2 contains a brief description of files located in the log directory. Many files include a datetime group, indicated by asterisks (\*), within the filename.

Table 6-2. Contents of the Log Directory

Table 0 2. Contents of the Log Directory	
Binary files; contain observation locations/types used by CODA for	
ice (ice), sea surface height (ssh), sea surface temperature (sst), and bathythermographs (xbt).	
bathythermographs (xbt).	
ASCII files; contains temporary information written by COAMPS®	
ASCII file; contains namelist information for the COAMPS® analysis	
and forecast executables	
ASCII file; includes all output selections for a COAMPS® forecast	
ASCII file; contains vertical velocity information at each timestep.	
ASCII file; contains output produced by the COAMPS® analysis	
executable. The output includes information for gridded data and	
observational fields ingested by the analysis.	
ASCII file; contains output produced by the COAMPS® forecast	
executable. The output includes information for each timestep of a	
model forecast.	
ASCII file; contains output produced by the COAMPS-OS® run_model	
script. The run_model script executes both the COAMPS <sup>®</sup> analysis	
and forecast.	
ASCII file; contains output produced by the COAMPS-OS® analysis	
and observation plotting routines.	
ASCII file; contains timing information from the COAMPS® analysis	
executable.	
ASCII file; contains timing information from the COAMPS® forecast	
executable	
ASCII file; temporary file used when reading topography files	

Occasionally, a COAMPS<sup>®</sup> analysis or forecast may terminate improperly and produce a file called "core" in the log directory. The core file may occupy a lot of space and should be removed from the log directory. The log files listed in Table 6-2 are most useful when attempting to troubleshoot problems with the COAMPS<sup>®</sup> analysis/forecast.

# **6.2.3** Graphical Products®

Each COAMPS<sup>®</sup> forecast should update the **COAMPS**<sup>®</sup> **Forecasts** webpage with new output products. Output products are accessible from the links displayed within the forecast matrix. Table 6-3 lists the default graphical products available from the **COAMPS-OS**<sup>®</sup> **Homepage**.

Table 6-3 Default graphical products of COAMPS-OS® for all grids

Table 6-3 Default graphical products of COAMPS-OS® for all grids		
General Plots		
Heights/Relative Vort/Winds at 500mb		
RH/Heights/Winds at 850mb		
RH/Heights/Winds at 925mb		
Sea Lev Pres/1000-500mb Thickness/Sfc Temp		
Sea Lev Press/Air Temp/Winds at 10m		
Accum Precip since tau 0		
Wind Speed Colored Streamlines at 10m		
Analysis Products		
Albedo		
Boundary Layer Height		
Ground Wetness		
Latent Heat Flux		
Sensible Heat Flux		
Ice Concentration		
Ice Concentration Climate		
Sea Level Pressure		
Snow Depth		
SST Climate		
Sea Surface Temperature		
Terrain Height		
Surface Roughness		
Observations		
Aircraft Report (acar)		
Aircraft Report (aire)		
Aircraft Report (amda)		
Pibals		
NOGAPS Pseudo-Obs		
Upper Air		
Satellite Temp		
Satellite Vapor		
Satellite Winds		
Surface Report (sfcm)		
Surface Report (sfcp)		
SSMI		

Missing observational plots indicates that the observations were not available to  $COAMPS^{\$}$ .  $COAMPS^{\$}$  is capable of running without observations.

# 7 The COAMPS-OS® Remote Monitor (RM)

The **Remote Monitor** (RM) is a powerful tool for troubleshooting. The RM serves as a prime reference for information regarding the status of COAMPS-OS<sup>®</sup>. A system administrator may use the RM to track down and eliminate problems including data availability, connectivity, data flow, disk usage, and hardware.

The RM must be configured properly to make status information and data flow details available allowing the system administrator to prevent problems and make timely corrections. End-to-end data flow is the key to operational success. The following sections are intended to provide operational reference material concerning RM functionality. Operational experience and consistent use of the RM are required to maintain a robust COAMPS-OS® system.

A system administrator may troubleshoot the COAMPS-OS® software using the web-based RM. The RM is accessible from a link on the COAMPS-OS® Homepage. An example of the main RM page is shown in Figure 1. The two main areas include status information for the COAMPS-OS® webserver and computational server. The table on the left provides links to status information regarding COAMPS-OS® running on a COAMPS® computational server called "cavu". The component processes are grids, observations, NOGAPS, forecast, Nowcast, and product generation. The right table provides information regarding the COAMPS-OS® webserver running on a webserver called "gimantis". Gimantis system status and webserver statistics may be accessed from the GUI buttons.

The RM provides periodic (five-minute) status reports for each component of COAMPS-OS<sup>®</sup>. Each button shows the status of a component of the COAMPS-OS<sup>®</sup> system. A user may click on a link to access more details regarding a specific status report.

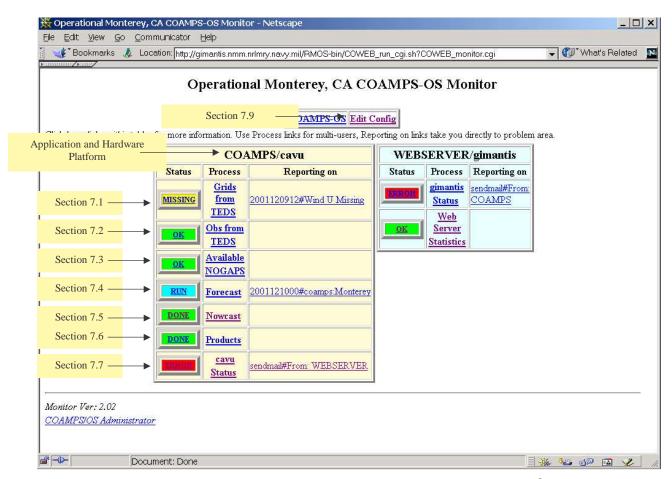
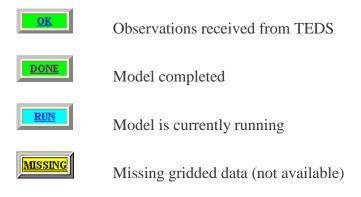
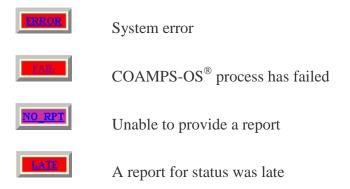


Figure 1. Main Remote Monitor page, accessible from the COAMPS-OS® Homepage. The status of each process is described in the sections that follow.

Status is reflected in the colors and text within the status column. For normal operations, the status will be **OK** (green), **RUN** (blue), or **DONE** (green). In cases where a problem has occurred, the button will reflect the problem by color as well as text, such as **MISSING**, or **ERROR**. Additional details concerning the problem will appear as a link in the column labeled **Reporting On**.

Each item in the **Process** column will be described below. Status buttons are interpreted by their color.





The following pages include a description of each component monitored by the RM. Detailed troubleshooting information is provided in sections indicated with:



## 7.1 Grids from TEDS Status Page

Current NOGAPS grids must be available for COAMPS-OS® to run. A cron job (daemon) is scheduled to execute every twelve hours to extract and format NOGAPS data from the Tactical Environmental Database Server (TEDS). The formatted fields are written to files to provide the first guess fields and boundary conditions for each COAMPS® model run. Without the NOGAPS files, a COAMPS® forecast cannot be run. Figure 2 shows the Grids from TEDS Status page.

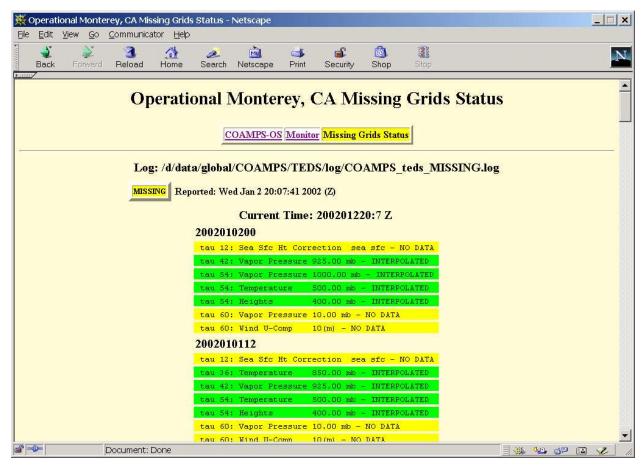


Figure 2. Example of RM page with grids retrieval status. The filename and full path of the log file are given at the top of the page. Reporting and current times are displayed above the status information. Some gridded fields were interpolated using nearby data (green). Missing data was reported because no nearby data was available for interpolation (yellow).

Each NOGAPS basetime is shown as a ten character integer using the convention: **YYYYMMDDTT**. **YYYY** represents a four-digit year. **MM** represents the two-digit month. **DD** represents the two-digit day. **TT** represents the two-digit hour/basetime (Z).

2002010200

In Figure 2, 2002010200 represents the basetime for 00Z on January 2, 2002. Lines beginning with the word, "tau", indicate the forecast time referenced by the report.

```
"TAU:" "PARAMETER NAME" "LEVEL" - "STATUS"
tau 12: Sea Sfc Ht Correction sea sfc - NO DATA
tau 42: Vapor Pressure 925.00 mb - INTERPOLATED
```

Lines highlighted in yellow indicate missing fields. Lines highlighted in green indicate levels that were successfully interpolated using data from existing, adjacent NOGAPS levels.



Check the page for excessive reports of **NO DATA**. If a single datetime group has more than two fields missing for a single tau (forecast hour), the administrator should check that periodic network interruptions are not disrupting the transfer of data. If the number of missing fields exceeds ten for a single tau, the administrator should contact the data provider to troubleshoot the problem.

Tau, Parameter Name, Level, and Data Status are listed for each time (Figure 2). An entry for a parameter at a tau indicates a potential problem. **INTERPOLATED** indicates that the field was initially missing but created by interpolating between the two adjacent levels.

## 7.2 Observations from TEDS Status Page

Observational fields are extracted and formatted from TEDS every hour (controlled by cron jobs) for use by the COAMPS<sup>®</sup> analysis. The cron jobs run 30 minutes after each hour. The COAMPS<sup>®</sup> analysis is capable of executing without observations; however, observational data may significantly improve the representation of the base weather conditions used to initialize a forecast. The TEDS observation retrieval log is displayed in Figure 3.

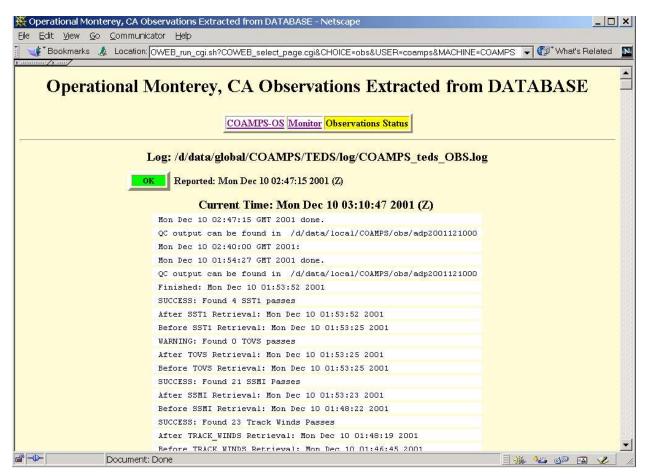


Figure 3. Example of RM page with observations retrieval status. The filename and full path of the log file are given at the top of the page. The *OK* status indicates that the observation extraction was successful. The log file also shows that QC was successful (first 5 lines of log), TOVS were unavailable (indicated by *WARNING*), and SSMI retrieval was successful (indicated by *SUCCESS*).



The sample screen in Figure 3 shows the location of the log, /d/data/global/COAMPS/TEDS/log/COAMPS\_teds\_OBS.log. The **OK** status and reporting time are displayed followed by contents of the log at the current time. Note the **WARNING** indicating that no TOVS passes were found.

A "WARNING: Found 0 ... Observations (or Passes)" message in the log file indicates that no data records were found in the TEDS database for a particular data type. The data flow into the database should be verified for a data type reporting 0 observations. If no **WARNING** or **SUCCESS** messages are reported for any data type (i.e. only the initial and final date/time printed), the data retreival is experiencing problems. Excessive reports of **WARNING** also indicate problems. Possible causes for excessive **WARNING** messages include problems with the **INFORMIX connect** configuration or problems with directory permissions.

# 7.3 Available NOGAPS Status Page

The available NOGAPS status page displays a list of datetime groups available to execute a COAMPS® analysis/forecast.

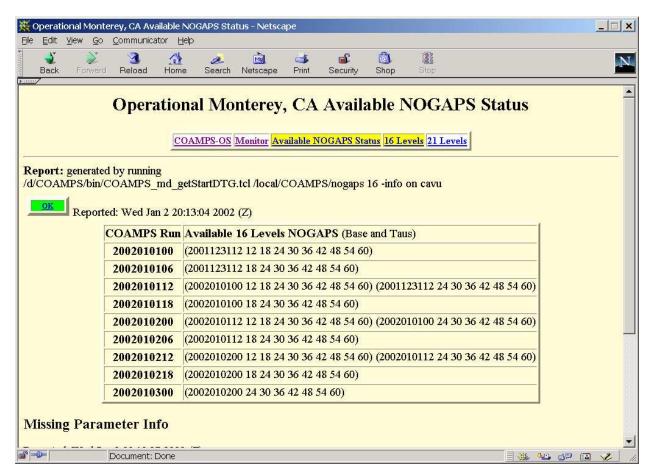


Figure 4. Example of RM page with NOGAPS status. The command for generating the report is given at the top of the page. For each basetime shown under *COAMPS Run*, is a list of the available taus.

The example shown in Figure 4 indicates that a COAMPS® forecast with a basetime of 00Z, 01 January 2002,

COAMPS Run 2002010100

may be run using the NOGAPS 12, 18, 24, 30, 36, 42, 48, 54, and 60 hour forecasts from the basetime of 12Z, 31 December 2001,

Available 16 Levels NOGAPS (Base and Taus) (2001123112 12 18 24 30 36 42 48 54 60)

The section labeled Missing Parameter Info contains diagnostic messages used by COAMPS-OS® developers to troubleshoot errors with the Available NOGAPS table. The message indicates datetime groups that were removed from the table and the reason for the removal. In general, the local COAMPS-OS® administrator will not need to review the Missing Parameter Info section.



COAMPS-OS® Administrator



The Available NOGAPS status page should show at least four available datetime groups under the column with the heading of COAMPS Run. If fewer than four datetime groups are shown, the administrator should consult the Grids from TEDS page to determine whether the proper grids have been downloaded to the COAMPS® server from TEDS. The administrator should also check that the NOGAPS directory is writeable by the COAMPS\_USER, and files within the NOGAPS directory are owned by the COAMPS\_USER indicated in the COAMPS-OS® configuration file. The Grids from TEDS page should also be consulted if the available datetime groups are not updated on a daily basis.

## 7.4 Forecast Status Page

Multiple authenticated users may be permitted to start a COAMPS<sup>®</sup> forecast. RM distinguishes the forecast status among multiple users using a drop-down menu. The menu appears as the mouse is moved over the **Forecast** link (Figure 5). *Note if only one authenticated user exists, the menu will not appear*. A COAMPS-OS<sup>TM</sup> Administrator may select a user from the drop-down menu to view the forecast status for the user.

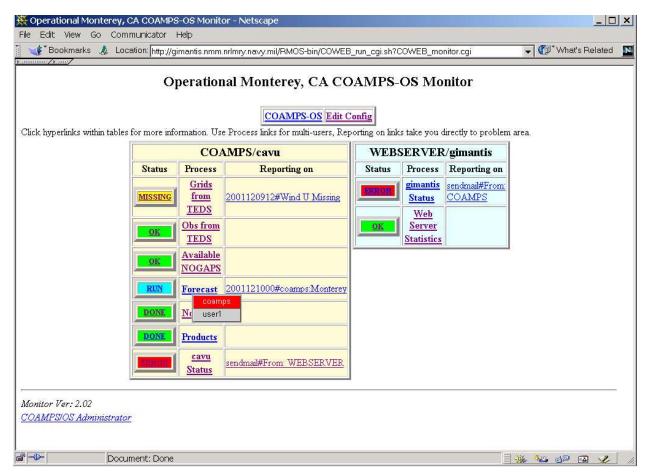


Figure 5. Example of RM page with forecast status. The example shows two users who are currently running COAMPS-OS® projects, "coamps" and "user1". When the mouse arrow is hovered over the Forecast link, the multi-user drop-down menu appears. Simply click on the appropriate user name to view the desired report.

After selecting the forecast status link, the webpage is updated with the forecast status for each COAMPS-OS® project. A sample Forecast Status Page is shown in Figure 5. If the user clicks either the button or datetime group, the webpage is updated with the summary file for the datetime group. The example shown in Figure 5 summarizes the status for the current projects: "Bering\_Sea", "Monterey", and "RED2". The status level of each forecast is summarized below:

A COAMPS-OS® analysis and/or forecast has successfully completed

A COAMPS-OS<sup>®</sup> analysis or forecast has terminated abnormally.

A COAMPS-OS<sup>®</sup> forecast is currently running

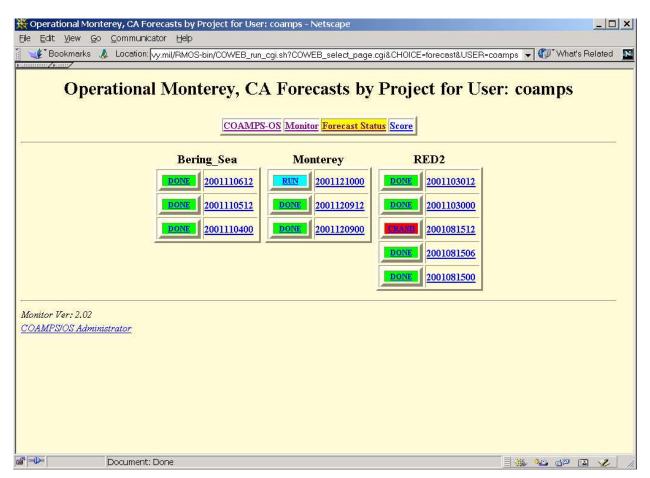


Figure 6. Forecast status for each project by user "coamps". The example shows three projects, "Bering\_Sea", "Monterey", and "RED2". A summary file for a specific datetime group will appear when a datetime group or status button is selected.



The COAMPS-OS® system administrator should consult the log files for datetime groups that crash. The COAMPS-OS® system administrator may consult the log files or timestep plot to determine the timestep where the forecast is currently executing. The RUN status indicates that the analysis, forecast, or visualization is currently running.

In a few cases, a datetime group may indicate a RUN status although the model is not running. The situation occurs when the run script has been terminated abnormally. For example, if the COAMPS® computational server is rebooted as the model is running, the log file does not update with the proper run status although the model has stopped. As a result, RM sees the last state of the run log. Eventually, the RUN status will disappear as the log file is automatically purged

(removed) from the system.

#### 7.4.1 Summary File

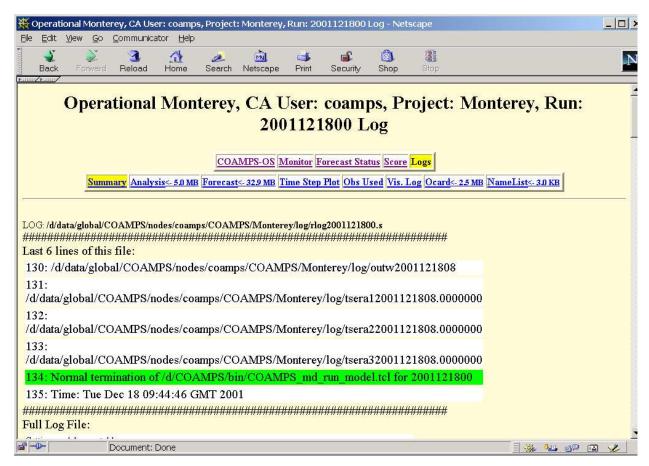


Figure 7. Example of RM page with project summary information. The green shading highlights a successful termination of the model run.

Figure 7 shows the summary file for a forecast project called "Monterey". The location of the summary file is indicated by the filename shown next to the "LOG:" reference.

LOG:/d/data/global/COAMPS/nodes/coamps/COAMPS/Monterey/log/rlog2001121800.s

The row of links shown near the top of the Forecast Status Page allows a user to navigate among multiple log files produced by the model and model pre/post processes.

Summary Analysis - 5.0 MB Forecast - 32.9 MB Time Step Plot Obs Used Vis. Log Ocard - 2.5 MB NameList - 3.0 KB

The model **Analysis** and **Forecast** logs may be accessed from the links shown in Figure 7. The links indicate the log file size in megabytes (MB). The **Time Step Plot** shows a graphical depiction of the model's run time versus actual time. The link is described in more detail in the next section.

The Obs Used button provides a table display indicating the types and number of observations

used by the analysis. The **Vis. Log** button provides a general summary of all visualization processes. The **Ocard** (output) and model **Namelist** files may also be accessed from the buttons shown in Figure 7.

#### 7.4.2 Time Step Plot

A graphical depiction of the amount of real time required by the COAMPS® forecast model to complete each forecast hour (tau) is shown in the RM Time Step Plot. Figure 8 shows an example of a Time Step Plot.

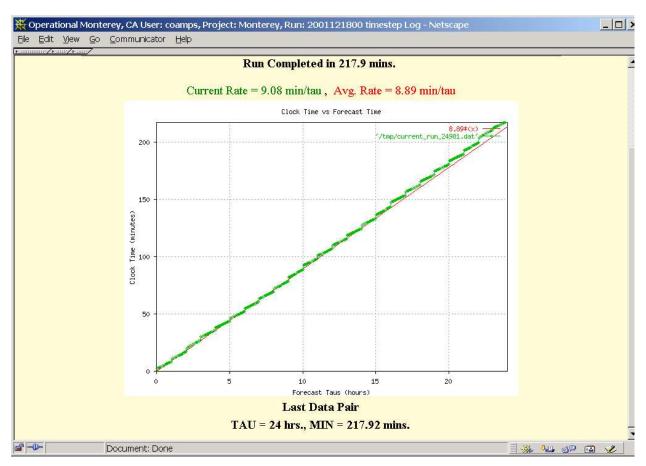


Figure 8. Example of a time step plot, showing the model run rate in minutes per forecast tau. The example indicates that the run completed in 217.9 minutes.

The green line indicates the run time of the selected datetime group for the selected project. The red line represents the average run time for all datetime groups for the selected project. If the green line is BELOW the red line, the COAMPS® forecast for the selected datetime group is FASTER than the average time. If the green line is ABOVE the red line, the COAMPS® forecast for the selected datetime group is SLOWER than the average time. The amount of time required for the model to complete each forecast hour (tau) is also shown numerically above the Time Step Plot.

Run Completed in 217.9 mins.

Current Rate = 9.08 min/tau , Avg. Rate = 8.89 min/tau



⚠ COAMPS-OS® Administrator ⚠



The COAMPS-OS® Administrator must recognize that many factors may influence the required time to complete a forecast. Some factors include grid spacing, number of grid points, number of grids, and system load. In general, reducing the number of grid points, number of grids, and system load will help the forecast model run faster. Increasing the grid spacing may also increase the speed of a COAMPS® forecast.

#### 7.4.3 Score Files

RM archives the completion rate of each  $COAMPS^{\circledast}$  forecast and **Nowcast**. The information is available from the **Select Score File** link highlighted in yellow in Figure 9.

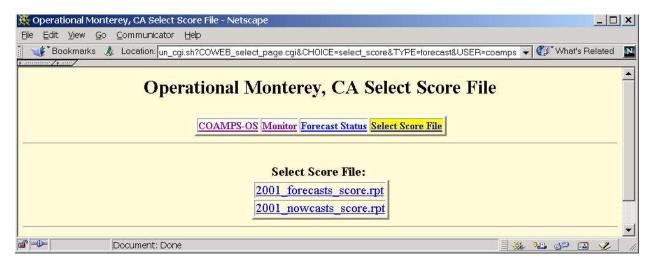
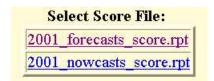


Figure 9. Example of score page, with links to Nowcast and forecast score reports.

The user may select a link (Figure 9) to view the forecast score report or **Nowcast** score report.



The score reports include a completion status for all datetime groups run for all projects. The score reports are described in the next section.

#### 7.4.4 Forecast Score Report

Figure 10 shows an example of the forecast score report page.

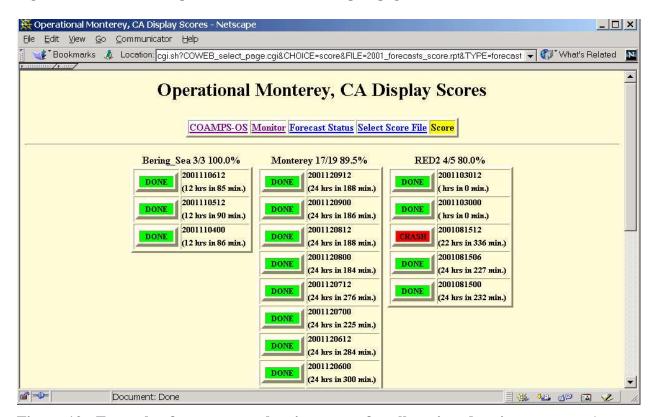
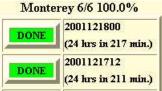


Figure 10. Example of score page, showing status for all project datetime groups. A score of 100% indicates all runs for a project were successful.

The completion rate for each project is shown beside each project name (Figure 10). The completion rate represents the fraction of successful forecasts from the total number of forecasts. The amount of time required for each forecast to complete is shown for each datetime group below the completion rate.

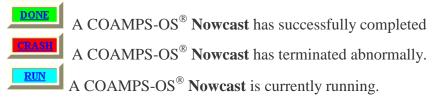




Multiple CRASH labels and low completion rates indicate a problem with the system. Check that all available NOGAPS data is available for the model to run the desired forecast duration. Frequent fluctuations in the completion time may indicate unusually high system loads. Ensure that forecasts do not overlap or execute concurrently with other CPU intensive processes.

## 7.5 Nowcast Status Page

COAMPS-OS<sup>®</sup> is capable of running an hourly analysis using previous COAMPS<sup>®</sup> forecast fields as the first-guess, background fields. The hourly analysis is called the COAMPS-OS<sup>®</sup> **Nowcast** and can be enabled from the COAMPS-OS<sup>®</sup> GUI. The status of the most recent COAMPS-OS<sup>®</sup> **Nowcast** is shown in the RM **Nowcast Status Page** (Figure 11). The status levels are summarized below:



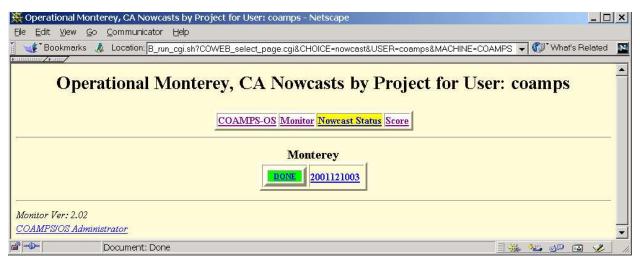


Figure 11. Example of Nowcast page, showing status of Nowcasts by project and datetime group.



In cases where the Nowcast crashes, the administrator may consult the log files by clicking the status button or datetime group.

The COAMPS-OS® Nowcast depends upon a previous COAMPS® forecast. If the COAMPS® forecast does not complete with a valid forecast at the Nowcast interval, the Nowcast will crash. Running the Nowcast may also slow the down the forecast model if the Nowcast and forecast are executing concurrently.

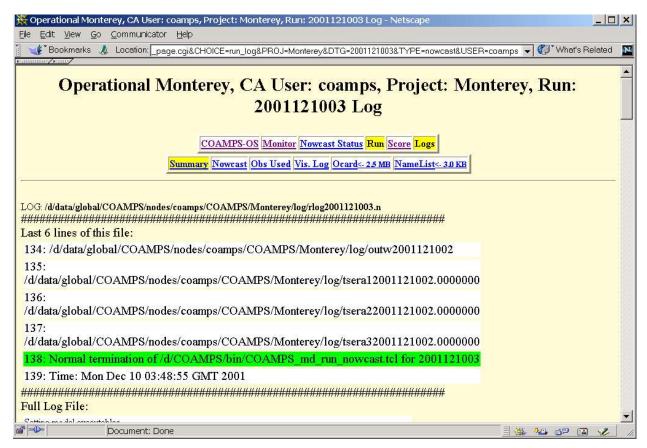


Figure 12. Example of a Nowcast summary page. The green shading highlights a successful termination of the Nowcast run.



Troubleshooting a Nowcast crash may be a difficult undertaking for a COAMPS-OS® administrator. In general, the administrator should ensure the following:

- A COAMPS® forecast is available at the Nowcast interval.
- No network problems are present.

If neither of these two items are causing the crash, the administrator should contact NRL or another qualified COAMPS-OS® support group.

## 7.6 Product Status Page

A COAMPS-OS<sup>®</sup> product status page is available for each user running a COAMPS-OS<sup>®</sup> analysis or forecast. The product status page is accessed by hovering the mouse cursor over the Products link and selecting the appropriate user from a drop-down menu. *Note if only one authenticated user exists, the menu will not appear*. An example of the drop-down menu is shown in Figure 13.

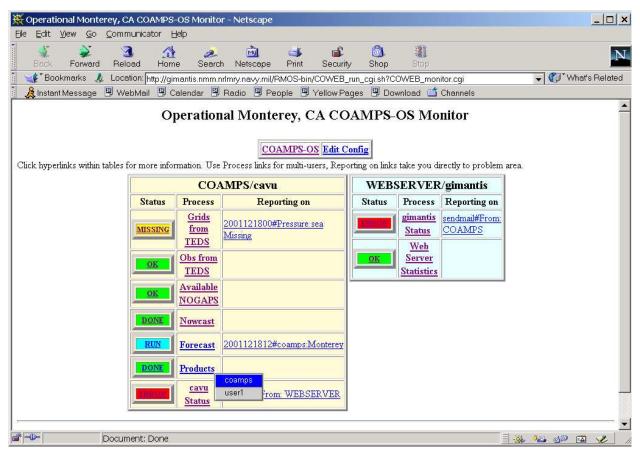


Figure 13. Example of selecting the RM products status according to user. The example shows two users who are currently running COAMPS-OS® projects, "coamps" and "user1". When the mouse arrow is hovered over the Products link, the multi-user drop-down menu appears. Simply click on the appropriate user name to view the desired report.

After selecting the appropriate user from the drop-down menu, the RM will display the COAMPS® charts log page described in the next section.



The COAMPS-OS® Administrator should only need to access the products page if a WARN, FAIL, or ERROR status is shown.

#### 7.6.1 Project Product Logs

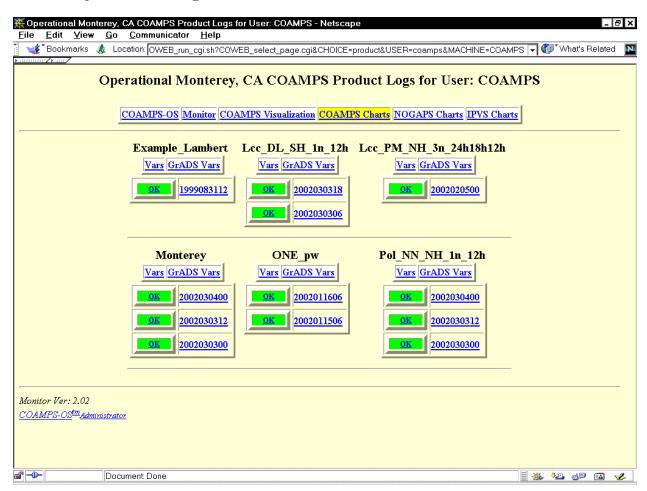


Figure 14. Example of RM product status page for COAMPS® IPVS\_Charts, showing the status of visualization products for each project and datetime group.

From the COAMPS<sup>®</sup> Charts page, select an area and datetime group to view the desired log file. A summary of the log will be shown in the browser. The Summary view allows the user to determine if any problems have occurred (e.g. GrADS scripts aborted, errors from visualization scripts, etc.).



If the user finds that some of the plots are not being created, or the meteograms are being plotted without desired variables, view the log file that is displayed by clicking **Details**. Search for lines, highlighted in red, which describe missing data/variable names. The lines are often found at the bottom of the log file. Note that the detailed log file is very large and may require some time to load into the browser.

From the product status page (Figure 14), click on the **IPVS Charts** button to view the status for IPVS\_CHARTS products. An example of the IPVS\_CHARTS RM page is shown in Figure 15.

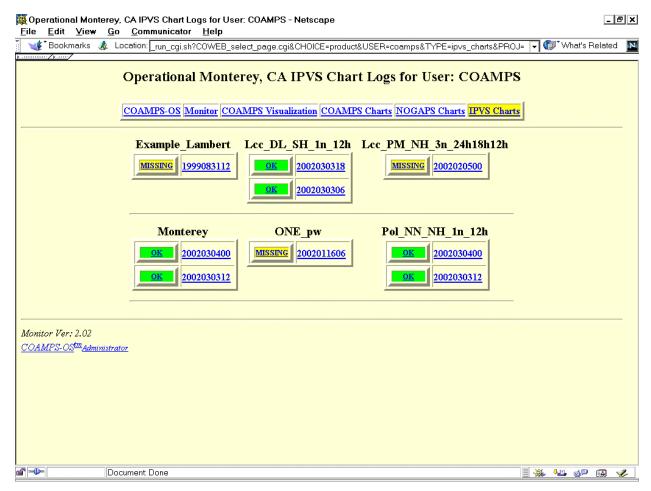


Figure 15. IPVS\_CHARTS product status page. The links on this page allow the user to view log files according to project and datetime group.

Below are some common causes for RM reporting status levels on the IPVS\_CHARTS predefined products.



Images were made successfully



A non-critical exception has occurred. For example, grid information has changed.



• An operating system error has occurred. For example, UX:cp: indicates a problem with the cp command.

36

• No such file or directory is available for the product.



Examples of FAIL reports include:

- Could not create \$areaconfigfile.
- \$areaconfigfile does not exist.
- The plots did not complete.
- Unable to open \$file.
- \$info file does not exist.
- Data not available from directory.
- Improper argument list.
- COAMPS\_ipvs\_neg.pl error.
- NOGAPS plots did not complete.



Failure to complete may be due to a script error.

Below are some common causes for RM reporting status levels on the IPVS\_CHARTS userdefined products.



Images were made successfully



A non-critical exception has occurred. For example, a requested display setting has been overridden or ignored. No corrective action is required.



Images not made. Check log file to determine reason. For example, no user-defined charts were created for the project.



Model failed, grid data are bad, system resources were exceeded, system permissions are inappropriate, or an IPVS\_CHARTS control script has failed.



Error occurred in a script.



 $lack \Lambda$  COAMPS-OS $^{ ext{ iny 8}}$  Administrator  $lack \Lambda$ 



Below are recommended actions for each status level for the IPVS CHARTS reports.



No action required



Correct system or process errors. Correct system permissions.



Correct model problems. Correct system permissions. Check system resources. Notify NRL and report errors.



Notify NRL and send log files with reported errors

## 7.7 Machine Status Page

The COAMPS-OS® machine status page summarizes the state of each machine used by COAMPS-OS® software.

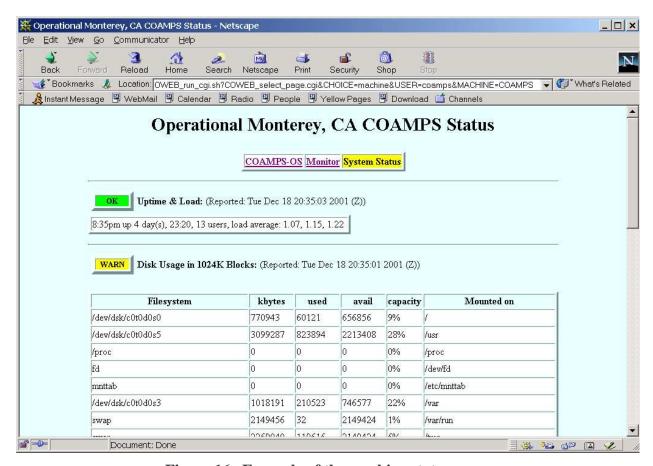


Figure 16. Example of the machine status page.

The machine status page reports on the items listed in Table 8-1. The RM allows the user to customize the reporting thresholds and email notifications. Section 8.9 provides further detail on editing the RM configuration.

**Table 8-1. Default Threshold Values for Machine Status Reports** 

Report	Command	Threshold
Crontab	crontab -1	Error if no crontab
Disk Usage in 1024K Blocks	df -k	86% (Warning)
		96% (Critical)
httpd	grep httpd or	Error if grep or head
	head "http:// <coweb_ip> : \$port</coweb_ip>	commands fail
Mail	/usr/bin/mail	Print 6 most recent
		messages
Ping	/usr/sbin/ping	30% packet loss (Critical)
Sendmail	telnet <ip_address> 25</ip_address>	Error if sendmail fails
TEDS Free Space	onstat -d	20% (Warning)
		10% (Critical)
Uptime & Load	/usr/bin/uptime	10 (Warning)
		18 (Critical)

#### 7.8 Statistics Status Page

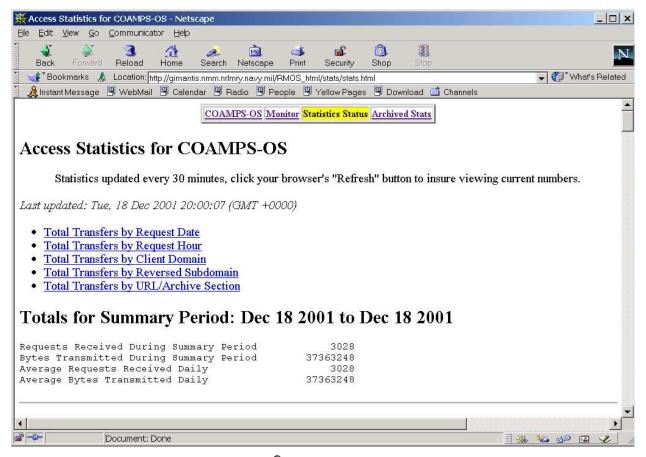


Figure 17. Example of COAMPS-OS® webserver statistics page. The information linked through this page is updated every 30 minutes.

The statistics page is generated by parsing the webserver access log. The statistics page represents a cumulative record of the requests received by the webserver throughout the day. Previous daily summaries are available by clicking on the **Archived Stats** button.

The following subsections are included on the webserver statistics page:

Total Transfers by: Request Date, Request Hour, Client Domain, Reversed Subdomain, and URL/Archive Section.

Typically, the last group will have a large number of requests for "/COWEB\_run\_cgi.sh". The requests are generated internally by the RM and do not represent requests by outside users.



The webserver statistics page is only available for systems using the Apache webserver. If Apache is not used for the COAMPS-OS® webserver, the statistics page will not be viewable. The statistics page requires the correct settings of the ACCESS\_LOG and ERROR\_LOG

variables in the COAMPS\_config.sh file. The variables should be set to the Apache access\_log and error\_log files.

# 7.9 COAMPS-OS® Remote Monitor Configuration Page

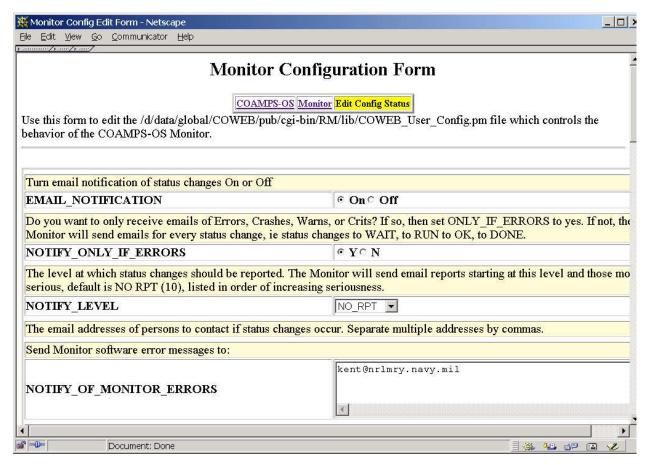


Figure 18. Example of RM configuration page, accessed by clicking *Edit Config Status* button.

The RM configuration page is invoked by clicking the **Edit Config** button at the top of the main RM page. The configuration form allows the user to significantly modify the behavior of the RM. *Therefore, the page is password protected!* Using the configuration page, the system administrator has control over which emails are sent and to whom the emails are sent.

Multiple email addresses may be entered into the **NOTIFY\_OF** sections with each address separated by a comma.

**NOTIFY\_LEVEL** controls the threshold status for email notification. A high status threshold (**Crit**) means that few email notices will be sent, meaning email notifications will only be sent when there are critical issues (unsuccessful processes). A low status threshold (**OK**) will generate an abundance of email because emails will be sent for processes that are successful and unsuccessful. The default, **NO\_RPT**, is a reasonable level for typical COAMPS-OS<sup>®</sup> usage.

**NOTIFY\_OF\_MONITOR\_ERRORS** should include email addresses for individuals who wish to receive notification of internal RM error messages (i.e., "Can't open file.").

The remaining three types of email notification pertain to **DATABASE** (if applicable to the COAMPS-OS<sup>®</sup> system), COAMPS<sup>®</sup>, and **MACHINE**. The **DATABASE** messages report status of data retrieval and management processes. COAMPS<sup>®</sup> messages refer to the execution of the model and product generation. **MACHINE** messages include load, usage, ping, etc. for the COAMPS-OS<sup>®</sup> machines. The email notifications can be turned off individually by setting the appropriate **PAGE** button to "N".

The last configurable items beginning with:

#### RUN COWEB WEBSERVER REPORTS ON SELF

allow the system administrator to selectively disable components of the RM program. The capability was added to facilitate performance testing of the model. The **RUN\_COWEB\_WEBSERVER\_REPORTS\_ON\_SELF** should be set to "Y" for the RM to function in a normal operational mode.

## **8** Changing System Identity

Section 8 describes the procedures required to change the IP address, hostname, and domain name information in COAMPS-OS<sup>®</sup>. Section 6.2 should only be performed after the COAMPS<sup>®</sup> and/or COWEB machines have changed the IP address, hostnames, or domain names.

#### 8.1 New IP address

- 1. Identify the new IP address
- 2. As user coamps, edit the /h/data/global/COAMPS/COAMPS\_config.sh file:
  - a. If the COAMPS server has changed IP address, modify the value for the variable, COAMPS\_IP.

COAMPS\_IP="new IP address"

b. If the webserver has changed ip address, modify the value for the variable, COWEB IP.

COWEB\_IP="new IP address"

3. Close and save the COAMPS\_config.sh file.

#### 8.2 New hostname/domain name

- 1. Identify the new hostname and/or domain name
- 2. As user coamps, edit /h/data/global/COAMPS/COAMPS\_config.sh file:
  - a. If the COAMPS® computational server's hostname has changed, modify the value for the variable, COAMPS\_MACHINE.

COAMPS MACHINE="new hostname"

b. If the webserver's hostname has changed, modify the value for the variable, COWEB MACHINE

COWEB\_MACHINE="new hostname"

c. If the COAMPS® computational server's domain name has changed, modify the value for the variable, COAMPS\_DOMAIN.

COAMPS\_DOMAIN="new domain name"

d. If the webserver's domain name has changed, modify the value for the variable, COWEB DOMAIN.

COWEB DOMAIN="new domain name"

3. Close and save the COAMPS\_config.sh file.

# 9 Installing and Configuring the COAMPS-OS® Webserver

Section 10 contains instructions for installing and configuring the Apache webserver. The Apache webserver is the default webserver delivered with the COAMPS-OS COTS Software.

## 9.1 Apache Webserver

#### **9.1.1** Apache Software Installation

- 1. Open a web browser and enter the URL: www.apache.org.
- 2. Find the latest, stable version of "Apache Server" software (click on the link on the left-hand side). Use the most current stable version.
- 3. Download the file apache[version\_number].tar.gz to /h/COTS/APACHE.
- 4. In a UNIX shell window, logged in as root, change directories to /h/COTS/APACHE.
- 5. Type gunzip -c apache[version\_number].tar.gz.
- 6. Type tar -xvf apache[version\_number].tar.
- 7. Change directories to apache[version\_number].
- 8. View INSTALL file to familiarize with the installation instructions.
- 9. Be sure that the .cshrc file has the path set to the new version of Perl.
- 10. Type ./configure -prefix=/h/COTS/APACHE to configure the compilation environment.
- 11. Type make.

#### 9.1.2 Apache Aliases

This section describes modifications required in the configuration file for the Apache webserver, httpd.conf.

- 1. Change directory to: /h/COTS/APACHE/conf.
- 2. (Optional) Edit the httpd.conf file, making the following changes:
  - DocumentRoot "/h/data/global/COWEB/pub/html/" (This will display the file index.html found in that directory.)
  - <Directory "/h/data/global/COWEB/pub/html/">
  - **AllowOverride None** (This will prevent users from specifying access control.)
- 3. Change the user and group to web and web:
  - User www
  - Group www
- 4. Modify the server administrator's email address:
  - ServerAdmin username@systemname.com
- 5. Modify the server name:
  - ServerName servername.com
- 6. Search for the string "Alias" and add the following lines to that section:
  - Alias /COAMPS\_html/

- "/h/data/global/COWEB/pub/html/"
- Alias /RM\_html/ "/h/data/global/COWEB/pub/cgibin/RM/html/"
- 7. Below that section, cut and paste a "Directory" segment:
  - <Directory "/h/data/global/COWEB/pub/html/">
- 8. Search for the string "ScriptAlias" and add the following lines the "ScriptAlias" section:
  - ScriptAlias /COAMPS-bin/ "/h/data/global/COWEB/pub/cgi-bin/"
  - ScriptAlias /RT-bin/ "/h/data/global/COWEB/pub/cgi-bin/RT/cgi-bin/"
  - ScriptAlias /RM-bin/ "/h/data/global/COWEB/pub/cgi-bin/RM/cgi-bin/"
- 9. Below the "ScriptAlias" section, add the "Directory" segments:
  - <Directory "/h/data/global/COWEB/pub/cgi-bin/">

  - <Directory "/h/data/global/COWEB/pub/cgi-bin/RM/cgi-bin/">
- 10. Change directory to: /h/COTS/APACHE/bin.
- 11. Start the webserver by typing ./apachectl start.
- 12. If the webserver does not start, there will be output statements that describe the steps to take for troubleshooting. (This may involve typing ./apachectl configtest.)

#### 9.1.3 Apache Password Protection

Section 10.1.3 describes the steps to password protect server-side files. Only users with the appropriate username and password will be allowed access to password protected services. COAMPS-OS password protection files are written and owned by user www. **Modifications to the files should be performed as user www.** 

1. COAMPS-OS requires four users and passwords to access web-based applications and services. The applications/services and default usernames are shown in Table 1.

Username	Application/Service	
coamps	COAMPS-OS GUI, Station GUI, IPVS-Charts, Vis5D, RM	
	configuration link, COAMPS-OS Help Manuals	
jit_admin	HPAC/VLSTrack GUI's	
db_Admin	WMO Observation GUI	
projects	COAMPS-OS projects that end in "_pw"	

Table 1. COAMPS-OS Default Usernames for Web-based Applications/Services

- 2. COAMPS-OS installation scripts will automatically create the users and password protection files required for the software. For reference, the commands may be run manually following the directions below:
  - Log in as user www and type:

```
/h/COTS/APACHE/bin/htpasswd -c
/h/COTS/APACHE/conf/COAMPSOS_pwd_coamps.
```

• You will be prompted twice to enter a password for "coamps". A file will be created called, /h/COTS/APACHE/conf/COAMPSOS\_pwd. The file will contain the username and encrypted password to authenticate users attempting to access password protected services from the webserver. Similarly, the other three users and password protection files are created using the following commands:

```
/h/COTS/APACHE/bin/htpasswd -c
/h/COTS/APACHE/conf/JIT_pwd jit_admin.
/h/COTS/APACHE/bin/htpasswd -c
/h/COTS/APACHE/conf/DB_pwd db_admin.
/h/COTS/APACHE/bin/htpasswd -c
/h/COTS/APACHE/conf/PROJECTS pwd project.
```

• To add users or change passwords in the "\_pwd" files, run the following command as user www:

```
/h/COTS/APACHE/bin/htpasswd
/h/COTS/APACHE/conf/[filename] [username]
```

#### where:

[filename] is either COAMPSOS\_pwd, JIT\_pwd, DB\_pwd, or PROJECTS\_pwd. [username] is the name of the user to add or modify.

The webserver does NOT need to be restarted when users or password files are modified.

- 3. COAMPS-OS installation scripts will automatically configure the proper files to be password protected in the Apache configuration file. For reference, the instructions to configure the filenames and pathes are shown below:
  - Open: ../apache/conf/httpd.conf.
  - Require a password for all files beginning with "COWEB\_pp\_" by adding the following entry as the last lines of the httpd.conf file:

```
<FilesMatch COWEB_pp_*>
```

```
AuthName "COAMPS-OS"
AuthType Basic
AuthUserFile [path]/COAMPSOS_pwd
require valid-user
</FilesMatch>
```

• Require a password for files associated with HPAC and VLSTrack applications by adding the following entry to the end of the httpd.conf file:

```
<FilesMatch ".*COWEB_jit_(HPAC|VLSTRACK)_.*_.*\.html">
   AuthName "HPAC/VLSTrack User"
   AuthType Basic
   AuthUserFile /h/COTS/APACHE/conf/JIT_pwd
   require valid-user
</FilesMatch>
```

• Require a password for files associated with the Observation Reader application by adding the following entry to the end of the httpd.conf file:

```
<FilesMatch COWEB_dm_ObsReaderDec_App.tcl>
  AuthName "Database Administrator"
  AuthType Basic
  AuthUserFile /h/COTS/APACHE/conf/DB_pwd
  require valid-user
</FilesMatch>
```

• Require a password for projects ending in "\_pw" by adding the following entry to the end of the httpd.conf file:

```
<Directory ~ "_pw">
   AuthType Basic
   AuthName "COAMPS Protected Projects"
   AuthUserFile /h/COTS/APACHE/conf/PROJECTS_pwd
   Options Indexes MultiViews
   AllowOverride None
   Order allow,deny
   Allow from all
   require valid-user
```

4. The Apache webserver is automatically started during the installation of COAMPS-OS. To restart the server and apply any changes to the httpd.conf file, log into the webserver as user root and type:

/h/COTS/APACHE/bin/apachectl restart.

# 10 Error Recovery Guidelines

The COAMPS-OS® Remote Monitor may be consulted by the system administrator to troubleshoot any errors or problems with the software.

50

## 11 Notes

## 11.1 Glossary of Acronyms

BUFR Binary Universal Format (WMO data)

COAMPS<sup>®</sup> Coupled Ocean/Atmosphere Mesoscale Prediction System

COAMPS-OS® COAMPS - On Scene

CODA COAMPS® Ocean Data Assimilation

DIMM Dual Inline Memory Module

DNS Domain Name System

FNMOC Fleet Numerical Meteorology and Oceanography Center

GMT Greenwich Mean Time

GRIB Gridded Binary format (WMO data)

IDS Informix Dynamic Server

IP Internet Protocol

IPVS Integrated Portable Visualization System

LAN Local Area Network

MVOI Multi-Variate Optimum Interpolation

NFS Network File System

NIPRNET Non-secure Internet Protocol Routing Network

NOGAPS Navy Operational Global Atmospheric Prediction System

NRL Naval Research Laboratory

OS Operating System

SCSI Small Computer System Interface

SGI Silicon Graphics Incorporated

# COAMPS-OS® System Administrator's Manual, Version 1.5

SIPRNET Secure Internet Protocol Routing Network

TEDS Tactical Environmental Data Server

WMO World Meteorological Organization

## Appendix A -- General System Administration Tasks Worksheet

The table below is provided to assist the system administrator to keep a record of general system administration tasks. When printed and completed, the table may be used to troubleshoot problems that may arise.

DATE: SYSTEM ADMINISTRATOR:		
Description	Action	Output
Check network	ping <system></system>	
connection.		
Check for network	netstat -i	
errors.	netstat -r	
	nfsstat	
	nslookup <system domain="" in="" local=""></system>	
	nslookup <system domain="" outside=""></system>	
Check print queues.	lpstat -t	
Check mail queues.	sendmail -bp	
Check for bounced		
mail errors, cron		
errors and other		
system problems.		
Check root mail.	Mail	
Record utilization of	ls -1 /var/mail	
directory for		
incoming mail.		
Record utilization of	ls -l /var/spool/mqueue	
directory for		
outgoing mail.		
Check daemons.	ps -ef   grep sendmail	
	ps -ef   grep in.named	
	ps -ef   grep cron	
	ps -ef   grep lpd	
	ps -ef   grep inetd	
Check available	df -k	
space for disk		
filesystems.		
Verify all	/etc/fstab	
filesystems mounted		
in the "du -k"		
listing.		
Check last log.	last	
Record users login		
addresses and last		
System boot.	mana /van/adm/massagas	
Check system logs.	more /usr/adm/messages	
Check uptime and load.	uptime	
Check process table.	ps -ef	
Record number of	hs -c1	
jobs, long-running		
jobs and jobs taking		
up unreasonable		
amounts of system		
resources.		
Check active	top -n	
processes.	wp "	
Check who is logged	W	
Check who is logged	<u> </u>	

# COAMPS-OS® System Administrator's Manual, Version 1.5

in to the system. Record length of login, number of		
users, and lengthy		
idle time.		
Check records for		
date of last monthly		
backup.		
Reboot the system.	reboot	

# Appendix B -- COAMPS-OS® System Administration Tasks Worksheet

The table below is provided to assist the system administrator in keeping record of system administration tasks for COAMPS-OS<sup>®</sup>. When printed and completed, the table may be used to troubleshoot problems that may arise.

DATE: SYSTEM ADMINISTRATOR:		
Description	Action	Output
Check COAMPS <sup>®</sup> log files.	/h/data/global/COWEB/pub/html/temp/* /tmp/* <coamps_data_dir>/local/COAMPS/ nodes/user1/v5d/* /d/data/global/COAMPS/nodes/user1/COA MPS/*/log/*</coamps_data_dir>	
Clean-up old files.		
Check project run times.		
Check graphics pages.		
Check links.		
Check webserver.	ps -ef   grep httpd	
Record file space (in MB) allocated to a single directory.	du -sk /h/data/global/COAMPS/* du -sk /h/data/global/COWEB/*	

# Appendix C -- Sample COAMPS-OS® Configuration File

```
</h/data/global/COAMPS/COAMPS_config.sh>
ACCESS_LOG="/opt/apache/logs/access_log"
export ACCESS LOG
BIN_URL="RM-bin"
export BIN_URL
COAMPS_ADMIN="cook@nrlmry.navy.mil"
export COAMPS_ADMIN
COAMPS_CGIBIN="COAMPS-bin"
export COAMPS_CGIBIN
COAMPS DATA DIR="/h/data"
export COAMPS_DATA_DIR
COAMPS_DOMAIN="nrlmry.navy.mil"
export COAMPS_DOMAIN
COAMPS GROUP="web"
export COAMPS GROUP
COAMPS HOME="/h/COAMPS"
export COAMPS HOME
COAMPS_HTML="COAMPS_html"
export COAMPS_HTML
COAMPS_IP="199.9.2.76"
export COAMPS_IP
COAMPS_MACHINE="cavu"
export COAMPS_MACHINE
COAMPS_SITE="Monterey, CA"
export COAMPS_SITE
COAMPS USER="coamps"
export COAMPS_USER
COWEB DATA DIR="/h/data"
export COWEB_DATA_DIR
COWEB_DOMAIN="nmm.nrlmry.navy.mil"
export COWEB_DOMAIN
COWEB_GROUP="web"
export COWEB_GROUP
COWEB HOME="/h/COWEB"
export COWEB HOME
COWEB IP="199.9.0.101"
export COWEB_IP
```

```
COWEB_MACHINE="gimantis"
export COWEB_MACHINE
COWEB USER="coweb"
export COWEB USER
DATA_DIR="/h/data"
export DATA_DIR
DM_DB_HOST="storm"
export DM_DB_HOST
DM_SUBCENTER_ID="10"
export DM_SUBCENTER_ID
ERROR_LOG="/opt/apache/logs/error_log"
export ERROR_LOG
HTML_URL="RM_html"
export HTML_URL
INFORMIXDIR="/opt/informix"
export INFORMIXDIR
INFORMIXSERVER="online coe"
export INFORMIXSERVER
JAVA_VM="/h/COTS/JAVA2/bin/java"
export JAVA_VM
JAVA40_CS="/h/COE/Comp/WEBBr4090/lib/java/classes/java40.jar"
export JAVA40_CS
LD_LIBRARY_PATH="/h/COAMPS/data/SUNlib/"
export LD_LIBRARY_PATH
OPHR="12"
export OPHR
OS COAMPS="SOL"
export OS_COAMPS
OS_COWEB="SOL"
export OS_COWEB
PARALLEL="3"
export PARALLEL
PERL_CS="/h/COE/Comp/PERL/bin/perl5.6.0"
export PERL_CS
PERL_WS="/h/COE/Comp/PERL/bin/perl5.6.0"
export PERL WS
RT BIN="RT-bin"
export RT_BIN
```

```
SAVE_DTG="no"
export SAVE_DTG
SAVE NUM="3"
export SAVE NUM
SSH="/usr/contrib/bin/ssh"
export SSH
TCLSH_CS="/h/COTS/TCLTK/bin/tclsh"
export TCLSH_CS
TCLSH_WS="/h/COTS/TCLTK/bin/tclsh"
export TCLSH_WS
TEDS FINAL TAU="60"
export TEDS_FINAL_TAU
TEDS_INITIAL_TAU="12"
export TEDS_INITIAL_TAU
TEDS_NUM_LEVELS="21"
export TEDS_NUM_LEVELS
TEDS_TAU_INCREMENT="6"
export TEDS_TAU_INCREMENT
WEB_GROUP="web"
export WEB_GROUP
WEB_USER="web"
export WEB_USER
WEBBr="/h/COTS/WEBBr/bin/netscape"
export WEBBr
WEBSERVER="gimantis.nmm.nrlmry.navy.mil"
export WEBSERVER
WISH83="/h/COTS/TCLTK/bin/wish8.3"
export WISH83
```